

Remarks

By this amendment, claim 3 is canceled, without prejudice or disclaimer of the subject matter therein. No new matter has been added, and no new issue of patentability has been raised as a result of this amendment, which is intended to put the application in condition for allowance, according to 37 C.F.R. §1.116(b). The following remarks are respectfully submitted.

§112 Rejection

Claim 3 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. Claim 3 is also rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant has canceled claim 3, without prejudice or disclaimer of the subject matter therein, rendering the rejections of claim 3 moot.

§103 Rejections

Claims 1-4 and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haberlander et al. (US 6,457,944) in view of Llewellyn (GB 2,130,305). Applicant has canceled claim 3, without prejudice or disclaimer of the subject matter therein, rendering the rejection of claim 3 moot. Applicant respectfully traverses the rejection of claims 1, 2, 4 and 7-10, asserting that the combination of references are not sufficient to render the claims *prima facie* obvious.

Claim 1 defines a method for controlling a diaphragm or piston pump, in which a rotating speed of a cam is varied during actuation of a compression stroke of the pump. The Examiner admits that Haberlander et al. do not teach varying a rotating speed of a cam during a compression stroke of a pump. The Examiner then notes that Llewellyn teaches a cam-driven piston pump in which the cam drives the pistons at a constant speed so as to produce uniform flow rate; however, as the Examiner has further noted, Llewellyn teaches that the driving of the pistons at the constant speed be accomplished by varying a profile of the cam, while maintaining a rotational speed of the cam. Thus, Llewellyn does not teach varying a rotational speed of a cam, but instead teaches that a profile of the cam be varied, and that the rotational speed thereof be maintained.

Although the teaching of Llewellyn, when directly combined with that of Haberlander et al., does not result in the method that is defined by claim 1, of the present application, the Examiner states that those of ordinary skill in the art are aware of mathematical disciplines of kinematics and calculus, and would be capable of deriving formulae for producing constant piston velocities with any cam profile. By this statement, Applicant presumes that the Examiner is asserting that one of ordinary skill would take the result of Llewellyn, that result being constant piston speed, apply this result in conjunction with a derived formula, to modify teaching of Llewellyn (that is, to change the teaching of Llewellyn from varying a profile of the cam to varying a speed of the rotation of the cam), and then to modify the teaching of Haberlander et al. according to the modified teaching of Llewellyn. Applicant respectfully asserts that this combination of modifications of the cited references, as proposed by the Examiner, would change the principle of operation of the invention that is disclosed by Haberlander et al., such that the teachings of these references are not sufficient to render claim 1 *prima facie* obvious. Support for this assertion may be found in the disclosure of Haberlander et al., for example, as detailed below.

Applicant respectfully directs the Examiner's attention to the end of column 6 and all of column 7 of Haberlander et al., where Haberlander et al. disclose the principle of operation behind a reciprocating pump stroke, or cycle 15, of a pump element 1, which pump stroke consists of a suction cycle 16 and a pressure cycle 17. In column 7, Haberlander et al. disclose that a control unit 8 sends control signals 10 to a frequency charger 4 that supplies an asynchronous motor 3 with a first voltage, which is at a relatively low frequency, to rotate the motor 3 at a low rotational speed during the pressure cycle 17 (comparable to the compression stroke of claim 1 of the present application), and with a second voltage, which is at a relatively high frequency, to rotate the motor 3 at a high rotational speed during the suction cycle 16. The control unit 8 is described as receiving an electrical position signal 13 from sensors 11 that detect whether the pump element 1 is disposed forward dead centre 18 or rearward dead centre 19. (At the beginning of the pressure cycle 17, the pump element 1 is disposed rearward dead centre 19, and, at the beginning of the suction cycle 16, the pump element 1 is disposed forward dead centre 18.) Control signals 10 from the control unit 8, in response to the aforementioned position signals 13, change the rotating speed of the motor 3 only at the beginning of the pressure cycle

17 (rearward dead centre 19) and at the end of the pressure cycle 17 (forward dead centre 18). Thus, the rotating speed of the motor 3 cannot be changed in the midst of the pressure cycle 17 without changing the operating principle of the control unit 8 and the asynchronous motor 3 that drives the pump element 1.

Furthermore, Haberlander et al. teach away from the modification, as proposed by the Examiner, in stating that the duration of each pressure cycle 17 is maximized for “a continuous and uniform dosing, which is as slow as possible” during each pressure cycle 17. (See column 7, lines 60-67.) This statement of Haberlander et al. teaches away from varying a rotating speed during the pressure cycle 17, since varying the rotating speed would necessarily shorten the duration of the pressure cycle from a maximum duration that is achieved by maintaining the lowest possible rotating speed throughout the pressure cycle 17.

In light of the arguments presented above, and with reference to paragraph VI of section 2143.01 of the MPEP, which states that “the proposed modification cannot change the principle of operation of a reference”, Applicant respectfully requests that the Examiner withdraw the rejection of claims 1, 2, 4 and 7-10.

Claims 6, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haberlander et al. in view of Llewellyn as applied to claim 1 above, and further in view of Weigold (WO 02/087057, as translated in US 2004/0027014). Applicant respectfully traverses the rejection of claims 6, 11 and 12, based upon the arguments presented above for claim 1, on which these claims depend, and respectfully requests that the Examiner withdraw the rejection of claims 6, 11 and 12.

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested. The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,

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Date

/Elisabeth Lacy Belden/
Elisabeth Lacy Belden
Registration No. 50,751

Customer No. 22859
Fredrikson & Byron, P.A.
200 South Sixth Street, Suite 4000
Minneapolis, MN 55402-1425 USA
Telephone: (612) 492-7000
Facsimile: (612) 492-7077

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